

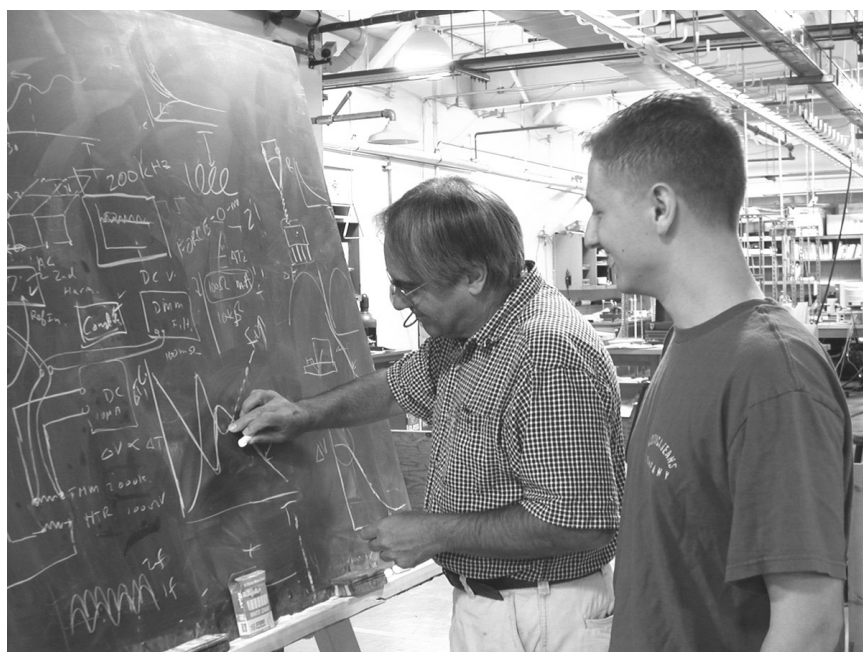
EDUCATIONAL PROGRAMS**REU AND RET ATTRACT THE BEST AND THE BRIGHTEST**

While most educational institutions become quiet during the summer months, the Center for Integrating Research and Learning is a bustling, high-energy area that is home away from home for 10 undergraduate students and 18 teachers. The Research Experiences for Undergraduates (REU) program and the Research Experiences for Teachers (RET) programs have attracted the best and the brightest from all disciplines of science and teaching. The laboratory is pleased to recognize the students, teachers, and mentors, along with their research topics in the tables presented on pages 20 and 21.

The Center staff conducts weekly seminars and mini-workshops that address issues such as Web-based resources, creating Web pages as tools for students and teachers, incorporating literature in the science classroom, using PowerPoint and other presentation software, and integrating writing into science activities. Student seminars have included lectures and demonstrations by Sastry Pamidi, Donovan Hall, Chris Hendrickson, Hamid Garmestani, and NHMFL Director Jack Crow. The current state of magnet research was the focus of several seminars, as students expanded their areas of expertise to the Center for Advanced Power Systems, ion cyclotron resonance, instrumentation and operations, especially user support, and micromechanics of materials. A combined weekly colloquium has been the venue for discussions of student-teacher classroom interactions, how to publish student and teacher work, and how to conduct research presentations. Students

and teachers traveled to the University of Florida to visit the Magnet Lab facilities there. The Microkelvin Laboratory and the McKnight Brain Institute were two highlights, with a spirited discussion of animal research and ethics of live animal testing.

In addition to the REU and RET programs, CIRL staff conducted a four-day summer institute for 44 area teachers. The response was overwhelming and teachers conducted such diverse activities as crystal-making and use of a digital microscope, creating model MagLev trains and conducting a competition, making kaleidoscopes, keeping science and nature journals, and making liquid nitrogen ice cream. The consensus among the 44 participants was that there would be changes in the science being done in area classrooms this fall!



Research Experiences for Teachers (RET) 2002

Name	School	Mentor	Area of Research
Pat Cramer	Deerlake Middle School- Tallahassee, FL	James Walker Sensory Research Institute	Measuring Canine Olfactory Function
Matt Guyton	Griffin Middle School- Tallahassee, FL	James Brooks Condensed Matter/Theory	1. The physics of microgranular material 2. A practical handbook of material science
David Lang	Sealey Elementary School Tallahassee, FL	Yusuf Hascicek Magnet Science & Technology	Preparing & Testing Superconductors
Monique Quinones	Hunter s Creek Elementary School- Orlando, FL	Eric Palm Instrumentation & Operations	Be Cool In School: The History of Refrigeration
Rich McHenry	Leon High School- Tallahassee, FL	Phil Kuhns and Arneil Reyes CIMAR	Modeling Nuclear Magnetic Resonance
Alan Turner	Roosevelt Middle School- Danielson, CT	Bob Goddard Magnet Science & Technology	Illusions - That's How I See It
John Willoughby	Rickards High School- Tallahassee, FL	Phil Kuhns and Arneil Reyes CIMAR	Modeling Nuclear Magnetic Resonance
Pat Wagner	Essrig Elementary School- Palm Harbor, FL	Roy Odom Geochemistry	Uranium Dating of Conglomerate Samples
Kim Zenon	Braden River Middle School- Bradenton, FL	Bob Goddard Magnet Science & Technology	Illusions - That's How I See It
Jennifer Rogers	Metro West Elementary School- Orlando, FL	Eric Palm Instrumentation & Operations	Be Cool In School: The History of Refrigeration
Farrell Rogers	Marshall Middle School- Lakeland, FL	Yusuf Hascicek Magnet Science & Technology	Preparing & Testing Superconductors
Ken Bowles	Apopka High School, Altamonte Springs, FL	Justin Schwartz Magnet Science & Technology	Superconductors: A Mobile Museum Exhibit
Brian McClain	Godby High School- Tallahassee, FL	Justin Schwartz Magnet Science & Technology	Superconductors: A Mobile Museum Exhibit
Scott Mazur	Killearn Lakes Elementary School- Tallahassee, FL	James Walker Sensory Research Institute	This Chamber s Smokin
David Rodriguez	Raa Middle School- Tallahassee, FL	Roy Odom Geochemistry	Uranium Dating of Conglomerate Samples
Joann Hartmann	Preservice teacher- Flagler College	Bob Goddard Magnet Science & Technology	Illusions - That's How I See It
Laura Harrison	Preservice teacher- Flagler College	James Brooks Condensed Matter/Theory	1. The physics of microgranular material 2. A practical handbook of material science
Carlos Villa	Preservice teacher- Florida State University	Roy Odom Geochemistry	Uranium Dating of Conglomerate Samples

The Center for Integrating Research & Learning is focusing on new programs for the fall and spring academic terms. The Director, Pat Dixon, will continue to teach science methods courses at Flagler College, which has provided the alternative of a four-year teaching degree for local community college students. Outreach is expected to reach record numbers, far

surpassing the over 11,000 contact hours spent with school children since January. Materials used in outreach sessions are being revised to include a component on superconductors and additional resources for middle and high school students. "Girls in Science" continues to be a priority project for the Center with a weeklong spring break camp for girls in the planning stages.

Research Experiences for Undergraduates (REU) 2002

Name	School	Mentor	Area of Research
Autumn Wyda	Carnegie Mellon University	Justin Schwartz Magnet Science & Technology	Effects of Doping in the MgB_2 Superconductor
Elizabeth Stringer	University of the South	Dragana Popovic Condensed Matter/Experimental	An Examination of Gallium Arsenide Semiconductors
Mark Wang	Dartmouth College	Yang Wang Geochemistry	Carbon Isotopic Ratios of Ancient Herbivore Diets
Keirse Crockett	Harvard University	Justin Schwartz Magnet Science & Technology	Effects of Doping in the MgB_2 Superconductor
Jason Crowe	Clarkson University	Philip Gao CIMAR	
Evan Goetz	University of Washington	James Brooks Condensed Matter/Theory	Heat Capacity of Heavy Fermion Compounds
April Jue	University of North Carolina- Chapel Hill	Philip Gao CIMAR	The Purification of "Mycobacterium Tuberculosis" Membrane Proteins
Alex Graffeo	FSU-FAMU College of Engineering	Luis Balicas Instrumentation & Operations	Changes in resistance of certain materials while exposed to various magnetic fields (0 to 33 T) at different angles
Melinda Lee Graham	Florida State University	Roy Odom Geochemistry	Staurolite Indicates Regional Metamorphism
Alisha Elsebough	Florida State University	Roy Odom Geochemistry	Staurolite Indicates Regional Metamorphism
Vanousheh Ghandehari	University of California-Berkeley	Hamid Garmestani Magnet Science & Technology	Biomechanical Comparison of Reptilian and Mammalian Prismatic Enamel Microstructures
Andrew Steinberg	Duke University	Mark Meisel UF Physics Affiliated Faculty	Biomagnetics: Middle Range Magnetic Fields and Its Effect on the Transcription of the Adh/GUS and Adh/GFP Promotor-Reporter Systems in ARABIDOPSIS thaliana
Jerrold Keilbasa	University of Florida	Mark Meisel UF Physics Affiliated Faculty	Low temperature techniques for detecting structural and magnetic transitions
Mary Woodruff	Iowa State University	Alex Lacerda LANL Pulsed Field Facility	Ytterbium Nickel Boron Carbide in High Magnetic Fields
Kathleen Leenerts	Colorado State University	Alex Lacerda LANL Pulsed Field Facility	Magnetic Properties including the Brillouin function
Winston Czakon	Georgia Institute of Technology	Alex Lacerda LANL Pulsed Field Facility	Fast Response Frequency Counter



Evaluation of CIRL programs is a focus for the next two years, with a Ph.D. student in Educational Leadership and Policy Studies at Florida State University heading up a structured program to investigate the results of signature programs such as the REU and RET. This takes CIRL to a new level of credibility among other RET and REU sites. CIRL will combine this data with data from the BRISC (Bringing Research into Science Classrooms) study to add new features to the programs.

The Center staff is excited about exploring new programs to respond to the needs of students, teachers, and the general public. This June saw the completion of the fourth year of providing professional development sessions for *Science, Tobacco & You*. Through the Florida Department of Health Awareness and Tobacco, the Center will again be conducting five regional training sessions in Florida. The successful curriculum package is now in use in over 20 states and Canada.

Support from the National High Magnetic Field Laboratory's scientists, researchers, staff, and faculty has enabled the Center to expand its educational programs into a national resource. We look forward to continuing already-successful programs and expanding to new directions.

For further information about the laboratory's education programs, contact Dr. Pat Dixon at 850-644-4707 or pdixon@magnet.fsu.edu.



REPORTS